

## **Claims**

We claim:

1. A method for generating a computer program, the method comprising:
  - 5 receiving user input specifying a prototype, wherein the prototype comprises a series of functional operations, wherein at least one of the operations has an associated one or more parameters;
    - 10 automatically generating a program that implements the prototype, in response to the specified prototype;
    - 15 wherein said automatically generating the program comprises automatically generating a graphical user interface for the program;
    - 20 wherein said generating the graphical user interface comprises creating user interface controls associated with the one or more parameters.
  - 15 2. The method of claim 1,
    - 25 wherein said automatically generating the program comprises programmatically generating the program in response to the specified prototype.
  - 20 3. The method of claim 1,
    - 30 wherein said automatically generating the program comprises automatically generating code for the program without direct user input.
  - 25 4. The method of claim 1,
    - 35 wherein at least one of the operations has an associated input parameter;
    - 40 wherein said generating the graphical user interface comprises creating a user interface control for interactively providing program input specifying a value for the input parameter.
  - 30 5. The method of claim 1,
    - 45 wherein at least one of the operations has an associated output parameter;

wherein said generating the graphical user interface comprises creating a user interface control for viewing program output indicating a value for the output parameter.

6. The method of claim 1, wherein a plurality of parameters are associated

5 with the functional operations, the method further comprising:

receiving user input specifying which of the plurality of parameters are desired to have associated user interface controls;

wherein said generating the graphical user interface comprises creating a user interface control associated with each specified parameter, but not creating user interface controls associated with unspecified parameters.

10 7. The method of claim 1,

wherein the generated program is a text-based program.

15 8. The method of claim 1,

wherein the generated program is a graphical program.

9. The method of claim 1,

wherein said receiving user input specifying a prototype is performed by a prototyping application;

20 wherein the prototyping application interfaces with a programming environment application in order to perform said generating the program.

10. The method of claim 1, wherein at least one parameter has an associated

25 data type, the method further comprising:

determining the data type of the at least one parameter;

wherein creating a user interface control associated with the at least one parameter comprises creating a user interface control according to the data type of the at least one parameter.

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11. The method of claim 1,

wherein the prototype specifies an image processing algorithm;  
wherein the generated program implements the image processing algorithm.

12. The method of claim 11,

5 wherein the generated program has a graphical user interface including one or more user interface controls for providing input parameter values affecting the image processing algorithm.

13. The method of claim 11,

10 wherein the generated program has a graphical user interface including one or more user interface controls for viewing output parameter values determined by the image processing algorithm.

15 14. A system for generating a computer program, the system comprising:

a prototyping environment application for receiving user input specifying a prototype, wherein the prototype comprises a series of functional operations, wherein at least one of the operations has an associated one or more parameters;

wherein the prototyping environment application is operable to automatically generate a program that implements the prototype, in response to the specified prototype;

20 wherein said automatically generating the program comprises automatically generating a graphical user interface for the program;

wherein said generating the graphical user interface comprises creating user interface controls associated with the one or more parameters.

25 15. The system of claim 14,

wherein said automatically generating the program comprises programmatically generating the program in response to the specified prototype.

16. The system of claim 14,

30 wherein said automatically generating the program comprises automatically generating code for the program without direct user input.

17. The system of claim 14,  
wherein at least one of the operations has an associated input parameter;  
wherein said generating the graphical user interface comprises creating a user  
5 interface control for interactively providing program input specifying a value for the  
input parameter.

18. The system of claim 14,  
wherein at least one of the operations has an associated output parameter;  
10 wherein said generating the graphical user interface comprises creating a user  
interface control for viewing program output indicating a value for the output parameter.

19. The system of claim 14,  
wherein a plurality of parameters are associated with the functional operations;  
15 wherein the prototyping environment application is operable to receive user input  
specifying which of the plurality of parameters are desired to have associated user  
interface controls;  
wherein said generating the graphical user interface comprises creating a user  
20 interface control associated with each specified parameter, but not creating user interface  
controls associated with unspecified parameters.

20. The system of claim 14,  
wherein the generated program is a text-based program.

25 21. The system of claim 14,  
wherein the generated program is a graphical program.

22. The system of claim 14,  
wherein the prototyping environment application interfaces with a programming  
30 environment application in order to perform said generating the program.

23. The system of claim 14,  
wherein at least one parameter has an associated data type;  
wherein the prototyping environment application is operable to determine the data  
type of the at least one parameter;

5        wherein creating a user interface control associated with the at least one parameter  
comprises creating a user interface control according to the data type of the at least one  
parameter.

24. The system of claim 14,  
10      wherein the prototyping environment application is an image processing  
prototype environment application;  
wherein the prototype specifies an image processing algorithm;  
wherein the generated program implements the image processing algorithm.

15      25. The system of claim 24,  
wherein the generated program has a graphical user interface including one or  
more user interface controls for providing input parameter values affecting the image  
processing algorithm.

20      26. The system of claim 24,  
wherein the generated program has a graphical user interface including one or  
more user interface controls for viewing output parameter values determined by the  
image processing algorithm.

25      27. A memory medium comprising program instructions executable to:  
receive user input specifying a prototype, wherein the prototype comprises a  
series of functional operations, wherein at least one of the operations has an associated  
one or more parameters;  
automatically generate a program that implements the prototype, in response to  
30      the specified prototype;

wherein said automatically generating the program comprises automatically generating a graphical user interface for the program;

wherein said generating the graphical user interface comprises creating user interface controls associated with the one or more parameters.

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28. The memory medium of claim 27,

wherein said automatically generating the program comprises programmatically generating the program in response to the specified prototype.

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29. The memory medium of claim 27,

wherein said automatically generating the program comprises automatically generating code for the program without direct user input.

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30. The memory medium of claim 27,

wherein at least one of the operations has an associated input parameter;

wherein said generating the graphical user interface comprises creating a user interface control for interactively providing program input specifying a value for the input parameter.

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31. The memory medium of claim 27,

wherein at least one of the operations has an associated output parameter;

wherein said generating the graphical user interface comprises creating a user interface control for viewing program output indicating a value for the output parameter.

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32. The memory medium of claim 27, wherein a plurality of parameters are associated with the functional operations, wherein the program instructions are further executable to:

receive user input specifying which of the plurality of parameters are desired to have associated user interface controls;

wherein said generating the graphical user interface comprises creating a user interface control associated with each specified parameter, but not creating user interface controls associated with unspecified parameters.

5           33.     The memory medium of claim 27,  
wherein the generated program is a text-based program.

34.     The memory medium of claim 27,  
wherein the generated program is a graphical program.

10           35.     The memory medium of claim 27,  
wherein said receiving user input specifying a prototype is performed by a  
prototyping application;  
              wherein the prototyping application interfaces with a programming environment  
15           application in order to perform said generating the program.

36.     The memory medium of claim 27, wherein at least one parameter has an  
associated data type, wherein the program instructions are further executable to  
determine the data type of the at least one parameter;  
20           wherein creating a user interface control associated with the at least one parameter  
comprises creating a user interface control according to the data type of the at least one  
parameter.

25           37.     The memory medium of claim 27,  
wherein the prototype specifies an image processing algorithm;  
wherein the generated program implements the image processing algorithm.

30           38.     The memory medium of claim 37,  
wherein the generated program has a graphical user interface including one or  
more user interface controls for providing input parameter values affecting the image  
processing algorithm.

39. The memory medium of claim 37,  
wherein the generated program has a graphical user interface including one or  
more user interface controls for viewing output parameter values determined by the  
5 image processing algorithm.

40. A computer-implemented method for automatically generating a computer  
10 program, the method comprising:

receiving program information specifying functionality of the computer program;  
automatically generating the computer program in response to the program  
information, wherein the computer program implements the specified functionality;  
wherein said automatically generating the program comprises automatically  
15 generating a graphical user interface for the program;

wherein said automatically generating the graphical user interface comprises  
automatically creating one or more user interface controls for providing input to and/or  
viewing output from the program.

20 41. The method of claim 40,

wherein said automatically generating the computer program comprises  
programmatically generating the computer program in response to the program  
information.

25 42. The method of claim 40,

wherein said automatically generating the computer program comprises  
automatically generating code for the program without direct user input.

43. The method of claim 40,

30 wherein each of the one or more automatically created user interface controls  
corresponds to one or more parameters specified by the program information.

44. The method of claim 40,  
wherein the generated computer program is a graphical program.

5       45. The method of claim 40,  
wherein the received program information specifies one of:  
          a prototype;  
          a test executive sequence; and  
          a state diagram.

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